CHAPTER 60
VIRGINIA STORMWATER MANAGEMENT PROGRAM (VSMP) PERMIT REGULATIONS
July 2, 2008
Part I Definitions (definitions relevant to water quantity criteria that are contained/proposed to be added to Part I of the regulations)

"Best management practice" or "BMP" means schedules of activities, prohibitions of practices, including both a structural or nonstructural practice, maintenance procedures, and other management practices to prevent or reduce the pollution of surface waters and groundwater systems from the impacts of land-disturbing activities. BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. ***(as found in current Part I draft)***

"Channel" means a natural or man-made watercourse with defined bed and banks that conducts continuously or periodically flowing water. ***(as found in current Part I draft)***

"Development" means land disturbance and the resulting landform associated with the construction of residential, commercial, industrial, institutional, recreation, transportation or utility facilities or structures. ***(as found in current Part I draft)***

"Flooding" means a volume of water that is too great to be confined within the banks or walls of the stream, water body, or conveyance system and that overflows onto adjacent lands, thereby causing or threatening damage. ***(as found in §10.1-603.2 of the Code of Virginia (SWM law))***

"Man-made" means constructed by man. ***(as found in current Part I draft)***

"Natural channel design concepts" means the utilization of engineering analysis and fluvial geomorphic processes to create, rehabilitate, restore, or stabilize an open conveyance system for the purpose of creating or recreating a stream that conveys its bankfull storm event within its banks and allows larger flows to access its bankfull bench and its floodplain. ***(as found in §10.1-560 of the Code of Virginia (E&S law))***

"Natural stormwater conveyance system", "natural channel" or "natural stream***" (from ESC Regs)*** means a nontidal waterway (watercourse?) that is part of the natural topography. It usually maintains a continuous or seasonal flow during the year and is characterized as being irregular in cross-section with a meandering course. Constructed channels such as drainage ditches or swales shall not be considered natural streams. ***(to include the main channel, floodway, and flood fringe?)***

"Peak flow rate" means the maximum instantaneous flow from a given storm condition at a particular location. ***(as found in §10.1-603.2 of the Code of Virginia (SWM law))***

"Point of discharge" means a location at which concentrated stormwater runoff is released from a site. ***(new definition)***

"Restored stormwater conveyance system" means a stormwater conveyance system that has been designed and constructed using natural channel design concepts. ***(new definition)***

"Runoff" or "stormwater runoff" means that portion of precipitation that is discharged across the land surface or through conveyances to one or more waterways. ***(as found in current Part I draft)***

"Runoff characteristics" include, but are not limited to velocity, peak flow rate, volume, and time of concentration, and their influence on channel morphology including sinuosity, channel cross-sectional area, and channel slope. ***(as found in current Part I draft)***

"Runoff volume" means the volume of water that runs off the land development project from a prescribed storm event. ***(as found in §10.1-603.2 of the Code of Virginia (SWM law))***

"Site" means the land or water area where any facility or activity is physically located or conducted, a parcel of land being developed, or a designated planning area in which the land development project is located. ***(as found in current Part I draft)***

"Site hydrology" means the movement of water on and off the site as determined by parameters including, but not limited to, soil types, soil permeability, vegetative cover, seasonal water tables, slopes, and impervious cover. ***(as found in current Part I draft)***

"Stormwater conveyance system" means any of the following, either within or downstream of the land disturbing activity: (1) a channel; (2) a man-made channel; (3) a restored channel; or (4) a natural stream. ***(new definition)***

"Watershed" means a defined land area drained by a river or stream, <u>karst system,</u> or system of connecting rivers or streams such that all surface water within the area flows through a single outlet. In karst areas, the karst feature to which the water drains may be considered the single outlet for the watershed. ***(as found in current Part I draft)***

"Wetlands" means those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. ***(as found in current Part I draft)***

Part II Stormwater Management Program Technical Criteria

<u>4VAC 50-60-66 Water Quantity</u>

Properties, state waters, and stormwater conveyances within or downstream of a land disturbing activity shall be protected from sediment deposition, erosion and flood damage due to increased runoff, either in concentrated or sheet flow, and changes in runoff characteristics in accordance with the minimum standards set out in this section.

A. Stormwater runoff from new development projects or projects occurring on prior developed lands shall be released from each outfall into a channel at or below a peak flow rate ($Q_{Developed}$) based on the one year 24-hour storm, calculated as follows or in accordance with another methodology that is demonstrated to achieve equivalent results and is approved by the board:

$$Q_{Developed} = Q_{Forested} * (RV_{Forested} / RV_{Developed}), \text{ where}$$

$Q_{Developed}$ = The allowable peak flow rate from the developed site

$Q_{Forested}$ = The peak flow rate from the site in a forested condition

$RV_{Forested}$ = The volume of runoff from the site in a forested condition

$RV_{Developed}$ = The volume of runoff from the developed site

B. Notwithstanding the requirements of subsection A, for each point of discharge at the land disturbing activity, if any one of the following conditions is met, then no additional stormwater quantity controls are required:

1. a. Prior to any land disturbance, the site's contributing drainage area to a point of discharge from the site is less than or equal to one (1) percent of the total watershed area draining to that point of discharge; and
   b. Based on the post-development land cover conditions prior to the implementation of any stormwater quantity control measures, the development results in an increase in the peak discharge of stormwater runoff from the site that is less than one (1) percent of the existing peak discharge of stormwater runoff generated by the total watershed area draining to that point of discharge.
2. The point of discharge releases stormwater into a man-made stormwater conveyance system that, following the land disturbing activity, (i) is not eroding, (ii) conveys the post-development 2-year 24-hour storm runoff without causing erosion of the system, and (iii) confines the post-development 10-year 24-hour storm runoff within the banks of the channel or pipe system. The applicant must demonstrate, using accepted hydrologic and hydraulic design methodologies, that the runoff from the site, in combination with other existing and proposed stormwater discharges does not exceed these criteria and does not cause instability of the system.
3. The point of discharge releases stormwater into a stormwater conveyance system that has been restored or will be restored using natural channel design concepts and, following the land disturbing activity, (i) is not eroding, and (ii) can be demonstrated, using accepted hydrologic and hydraulic design methodologies and in combination with other existing and proposed stormwater discharges, to not exceed the design criteria of the restored conveyance system and to not cause instability of the system.
4. The point of discharge releases stormwater into a natural stormwater conveyance system that, following the land disturbing activity, (i) is not eroding, (ii) confines the post-development 10-year 24-hour storm runoff within the banks of the stormwater conveyance system**,** (iii) does not cause instability of the system, and

(iv) replicates the site pre-development runoff characteristics and site hydrology for the 1-year 24 hour storm utilizing the following equation:

$Q_{Developed} = Q_{Pre\text{-}Developed} * (RV_{Pre\text{-}Developed} / RV_{Developed})$, where

$Q_{Developed}$ = The allowable peak flow rate of runoff from the developed site

$Q_{Pre\text{-}Developed}$ = The peak flow rate of runoff from the site in the pre-developed condition

$RV_{Pre\text{-}Developed}$ = The volume of runoff from the site in the pre-developed condition

$RV_{Developed}$ = The volume of runoff from the site in the developed site

C. For purposes of computing predevelopment runoff from prior developed sites, all pervious lands on the site shall be assumed to be in good hydrologic condition in accordance with NRCS standards, regardless of conditions existing at the time of computation. Predevelopment runoff calculations utilizing other hydrologic conditions may be utilized where stream channel erosion or localized flooding at the site does not exist provided that it is demonstrated to and approved by the local program authority that actual site conditions warrant such considerations.

D. Pre-development runoff characteristics and site hydrology shall be verified by physical surveys, available soil mapping or studies, and calculations consistent with good engineering practices in accordance with guidance provided in the Virginia Stormwater Management Handbook and by the qualifying local program.

E. Flooding and channel erosion impacts to stormwater conveyance systems shall be calculated for each point of discharge from the site and such calculations shall include estimates of runoff from the developed site and the entire upstream watershed which contributes to that point of discharge. Good engineering practices and calculations in accordance with DCR guidance shall be used to evaluate post development runoff characteristics and site hydrology, and flooding and channel erosion impacts.

4VAC50-60-73. Design Storms

For the purposes of this chapter, unless otherwise specified, the design storms are the 1-year, 1.5-year, 2-year, and 10-year 24-hour storms using the site-specific rainfall precipitation frequency data recommended by the U.S. National Oceanic and Atmospheric Administration (NOAA) Atlas 14. Partial duration time series shall be used for the precipitation data. Unless otherwise specified, the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) synthetic 24-hour rainfall distribution or hydrologic and hydraulic methods developed by the U.S. Army Corps of Engineers, or both, shall be used to conduct the analysis described in this section. ~~The local program may allow for the use of the Modified Rational (critical storm duration) Method.~~